

Gas Actuated Thermometers Stainless Steel Series, Model 73

WIKA Data Sheet TM 73.01

Applications

- For aggressive media in the chemical, petrochemical and process engineering industries
- Universally suitable for plant, machinery, tank, apparatus construction and food industry
- Temperature measurement without any contact to the medium
- Mounting in instrument boards, control cabinets, control panels

Special Features

- Instruments meet the highest standards of measurement technology
- Case and stem material stainless steel
- For external mounting on pipes and tanks
- Various designs of connection and case mounting
- Also versions with adjustable stem and dial, with capillary, with contact bulb or in panel mounting design (square)

Description

This series of thermometers is universally suitable for the machinery, plant and apparatus construction. Gas actuated thermometers with capillary are used in locations which are not easily accessible and where long distances have to be bridged.

The stem, the process connection and the case of the instrument ¹⁾ are made from stainless steel. Various insertion lengths and process connections are available to optimally match the requirements of each process. The thermometers have a high ingress protection of IP 65 and can be used in outdoor applications even at minus temperatures. With liquid damping they are suitable for use under high-vibration conditions.



Fig. left: Lower mount (LM) Model R73.100

Fig. centre: With Capillary and Surface Mounting Bracket Model F73.100

Fig. right: Adjustable Stem and Dial Model S73.100

Due to the wide variety of possible designs the Model 73 gas actuated thermometers can be perfectly adapted to any process connection and location. The adjustable stem and dial version can be adjusted to any angle to allow easy reading. With the version with contact bulb temperature measurements are possible without any contact to the medium, even when the pipe diameter is extremely small. The contact bulb is intended for external mounting on pipes and tanks. When mounting this thermometer version, it has to be ensured that the contact bulb is in contact with the measuring point over its complete length.

1) Not with Model Q73.144, panel mounting case galvanised steel.

Standard features

Temperature element

Inert gas expansion system (non-toxic)

Nominal size in mm

100, 160, 144 x 144

Design of connection

- S Standard (male thread connection)
- 1 Plain stem
- 2 Male nut
- 3 Union nut
- 4 Compression fitting (sliding on stem)
- 5 Union nut with fitting
- 6 Compression fitting (sliding on capillary or armoured capillary, see page 10 and 11)

Location of stem

A73.XXX centre back (axial)
R73.XXX bottom (radial)
S73.XXX centre back, adjustable stem and dial
F73.XXX with capillary
Q73.144 panel mounting series

Accuracy class

Class 1 per DIN EN 13 190

Working range

Normal (1 year): measuring range per DIN EN 13 190
Short time (24 h max.): scale range per DIN EN 13 190

Nominal use

EN 13 190

Case, bezel ring, stem, process connection

Stainless steel

Adjustable Stem and Dial

Stainless steel
Rotatable on stem 360°
Stem adjustable every angle

Panel mounting case and panel frame

Galvanised steel

Contact bulb

120 x 22 x 12 mm, stainless steel 1.4571

Capillary

2 mm diameter, stainless steel 1.4571, bending radius no less than 6 mm, length to user specifications

Dial

White aluminium with black lettering

Window

Laminated safety glass
(panel mounting series: non-splintering plastic)

Pointer

Adjustable black aluminium pointer

Temperature limits for storage and transport

-50 °C ... +70 °C (EN 13 190) without liquid damping
-20 °C ... +60 °C (EN 13 190) with food-compatible liquid damping
-50 °C ... +60 °C (EN 13 190) with liquid damping

Ambient temperature limit at the case

0 °C ... +40 °C max. (others on request)

Pressure rating of stem

25 bar max., static

Ingress protection

IP 65 per EN 60 529 / IEC 529
Exception with Model Q73.144: IP 65 at the front
IP 40 at the back

Design of case mounting with F73.XXX

- Surface mounting flange, stainless steel
- Surface mounting bracket, die cast aluminium
- Panel mounting flange, stainless steel
- Triangular bezel with bracket, stainless steel

Options

- Scale range °F, °C/°F (dual scale)
- Case with liquid damping
- Case with food-compatible liquid damping
- Armoured or coated capillary: armoured capillary Ø 7 mm, flexible or capillary with PVC coating
- Stem diameter 6, 8, 10, 12 mm (others on request)
- Alarm contacts (see data sheet AC 08.01)
- Ingress protection IP 66 (not for gauges with alarm contacts)
- Special temperature range or dial printing to customer specifications (on request)

Scale, measuring ranges ¹⁾, error limit (DIN EN 13 190)

Scale graduation per WIKA standard

Scale range in °C	Measuring range in °C	Scale spacing in °C	Error limit ± °C
-80 ... +60	-60 ... +40	2	2
-60 ... +40	-50 ... +30	1	1
-40 ... +60	-30 ... +50	1	1
-30 ... +50	-20 ... +40	1	1
-20 ... +60	-10 ... +50	1	1
-20 ... +80	-10 ... +70	1	1
0 ... 60	+10 ... +50	1	1
0 ... 80	+10 ... +70	1	1
0 ... 100	+10 ... +90	1	1
0 ... 120	+10 ... +110	2	2
0 ... 160	+20 ... +140	2	2
0 ... 200	+20 ... +180	2	2
0 ... 250	+30 ... +220	5	2.5
0 ... 300	+30 ... +270	5	5
0 ... 400	+50 ... +350	5	5
0 ... 500	+50 ... +450	5	5
0 ... 600	+100 ... +500	10	10
0 ... 700	+100 ... +600	10	10

1) The measuring range is indicated on the dial by two triangular marks. Only within this range the stated error limit is valid per DIN EN 13 190.

Models

Model	NS	Location of stem
A73.100	100	centre back
A73.160	160	centre back
R73.100	100	radial bottom
R73.160	160	radial bottom
S73.100	100	adjustable stem and dial
S73.160	160	adjustable stem and dial
F73.100	100	with capillary
F73.160	160	with capillary
Q73.144	144	panel mounting series

Dimensions in mm

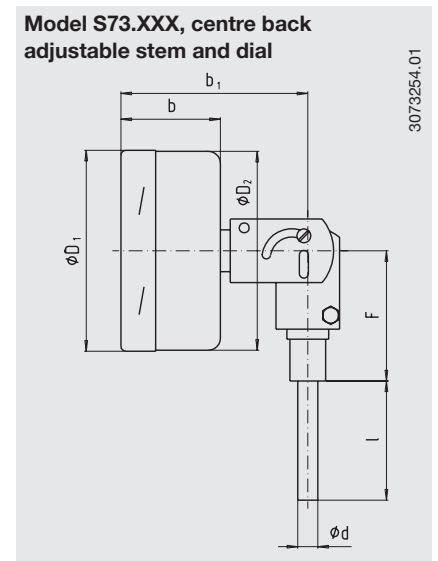
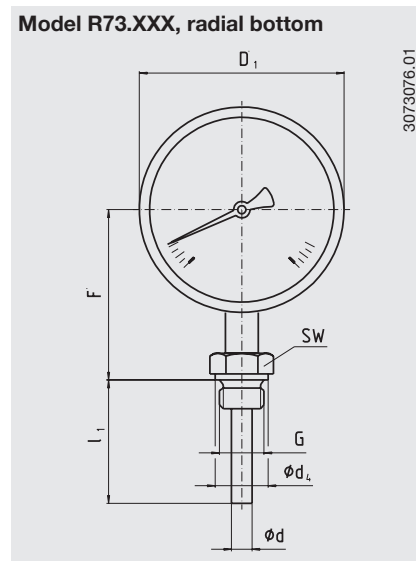
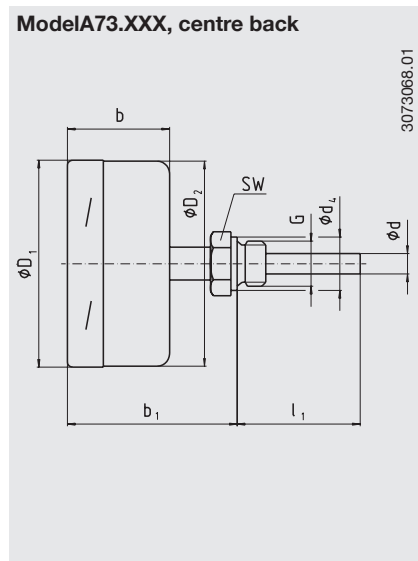


Table of dimensions for Model A73.XXX and R73.XXX

Nom. size	Dimensions in mm												Weight in kg	
	Alarm contacts of Model 811, 821 or 831													
NS	without		1- or 2-way		3-way		d	d ₄	D ₁	D ₂	F ¹⁾	G	SW	
	b	b ₁ ¹⁾	b	b ₁ ¹⁾	b	b ₁ ¹⁾								
100	50	83	88	121	-	-	8 ²⁾	26	101	99	83	G ½ B	27	1.1
160	50	83	88	121	96	129	8 ²⁾	26	161	159	113	G ½ B	27	1.4

1) With scale ranges $\geq 0 \dots 500$ °C the dimensions increase by 40 mm.

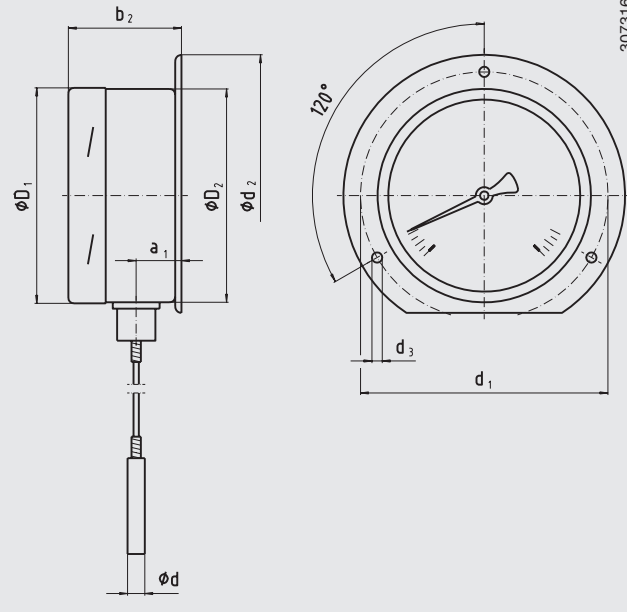
2) Option: stem diameter 6, 10, 12 mm

Table of dimensions for Model S73.XXX

Nom. size	Dimensions in mm										Weight in kg
	Alarm contacts of Model 811, 821 or 831										
NS	without		1- or 2-way		3-way		d	D ₁	D ₂	F	
	b	b ₁	b	b ₁	b	b ₁					
100	50	93	88	131	-	-	8 ²⁾	101	99	68	1.3
160	50	93	88	131	97	140	8 ²⁾	161	159	68	1.6

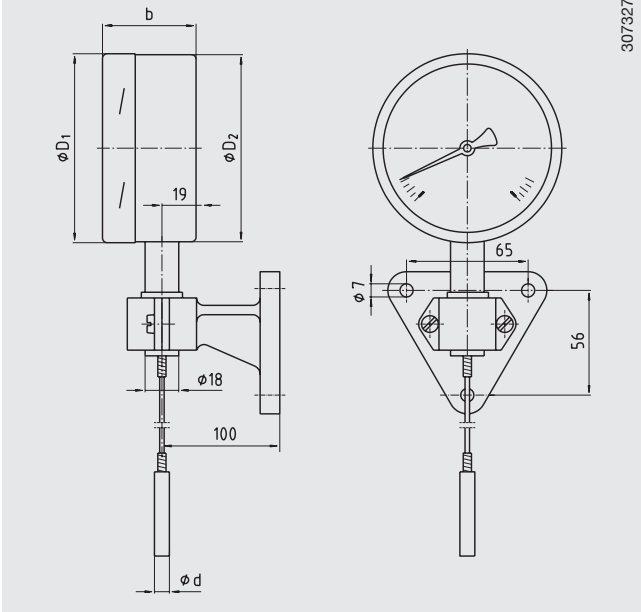
2) Option: stem diameter 6, 10, 12 mm

Model F73.XXX, with capillary and surface mounting flange



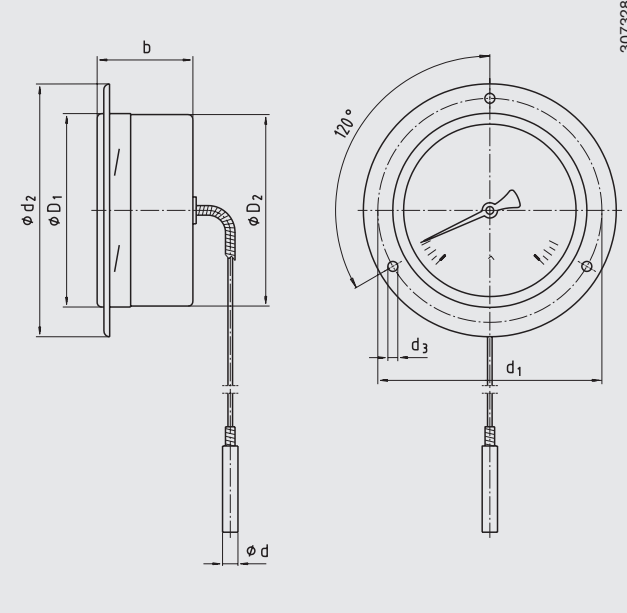
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Model F73.XXX, with capillary and surface mounting bracket



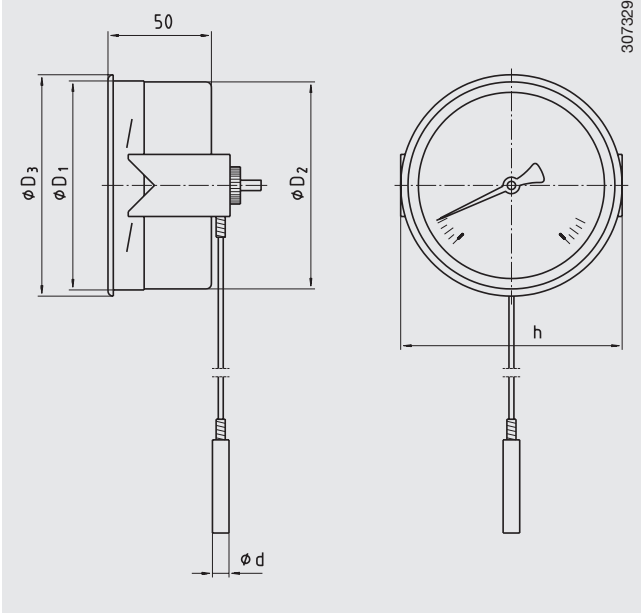
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Model F73.XXX, with capillary and panel mounting flange



3073289.02

Model F73.XXX, with capillary and triangular bezel with bracket ¹⁾



3073297.02

1) Not suitable for alarm contacts.

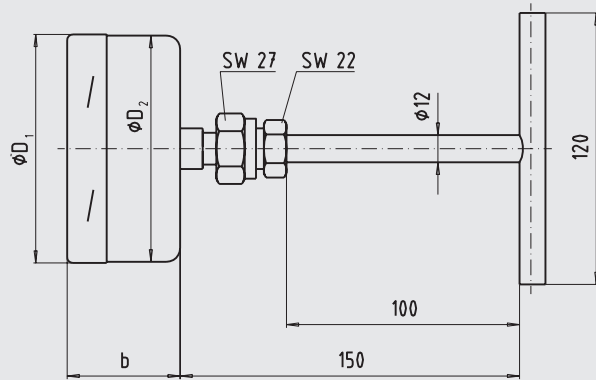
Table of dimensions for Model F73.XXX (with capillary)

Nom. size	Dimensions in mm														Weight in kg
	Alarm contacts of Model 811, 821 or 831														
NS	without		1- or 2-way		3-way		d	d ₁	d ₂	d ₃	D ₁	D ₂	D ₃	h	
	b	b ₁	b	b ₁	b	b ₁									
100	50	53	88	91	-	-	8 ¹⁾	116	132	4.8	101	99	107	107	1.4
160	50	53	88	91	97	100	8 ¹⁾	178	196	4.8	161	159	166	172	1.8

1) Option: stem diameter 6, 10, 12 mm

**Model A73.XXX, with contact bulb
centre back**

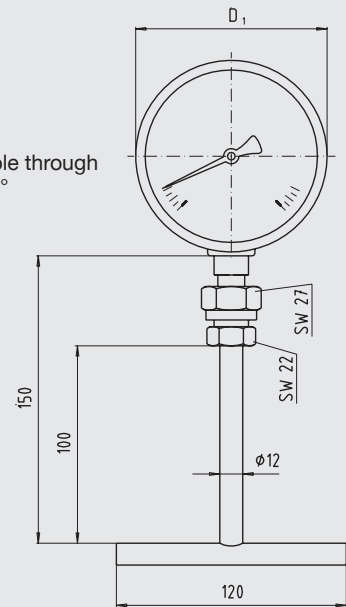
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**Model R73.XXX, with contact bulb
radial bottom**

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Case rotatable through
approx. 350 °



**Model S73.XXX, with contact bulb
centre back,
adjustable stem and dial**

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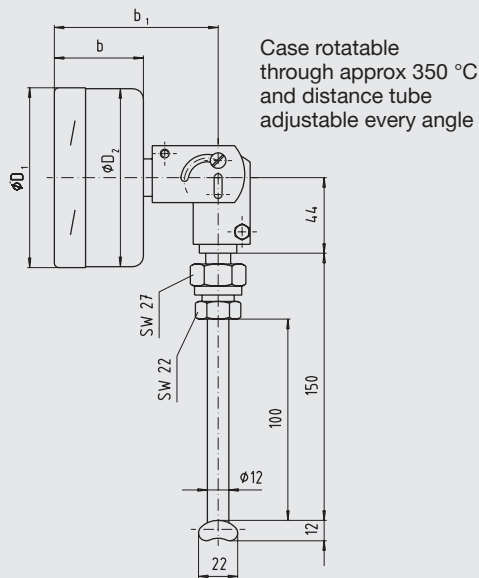
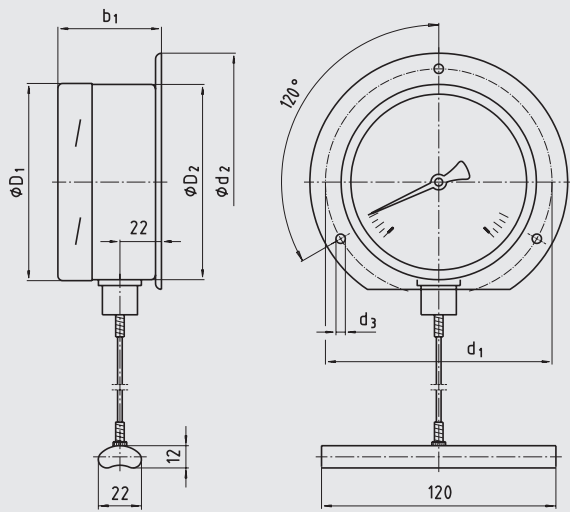


Table of dimensions for Model A73.XXX, R73.XXX and S73.XXX (with contact bulb)

Model	Nominal size	Dimensions in mm								Weight in kg
		Alarm contacts of Model 811, 821 or 831 without		1- or 2-way		3-way		D_1	D_2	
NS	b	b_1	b	b_1	b	b_1				
A73.100	100	50	-	88	-	-	-	101	99	0.8
A73.160	160	50	-	88	-	97	-	161	159	0.9
R73.100	100	50	-	88	-	-	-	101	99	0.8
R73.160	160	50	-	88	-	97	-	161	159	0.9
S73.100	100	50	93	88	131	-	-	101	99	0.9
S73.160	160	50	93	88	131	97	140	161	159	1.0

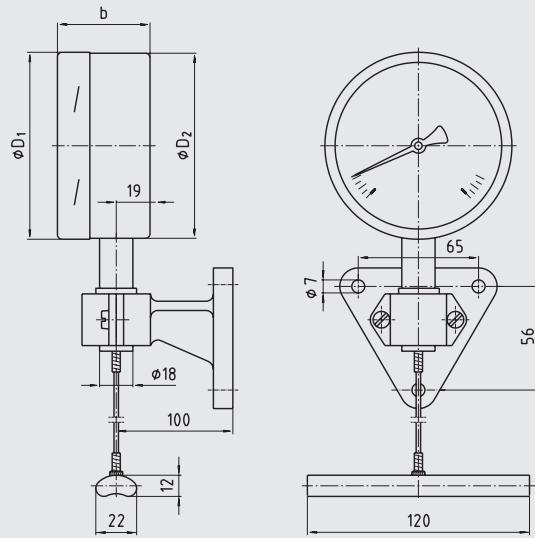
Model F73.XXX, with contact bulb capillary and surface mounting flange

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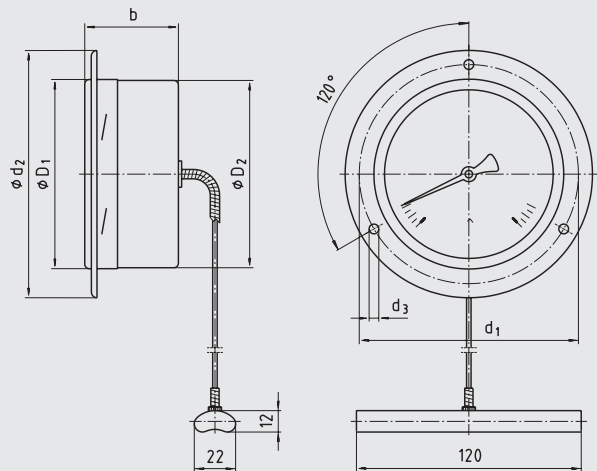
Model F73.XXX, with contact bulb capillary and surface mounting bracket

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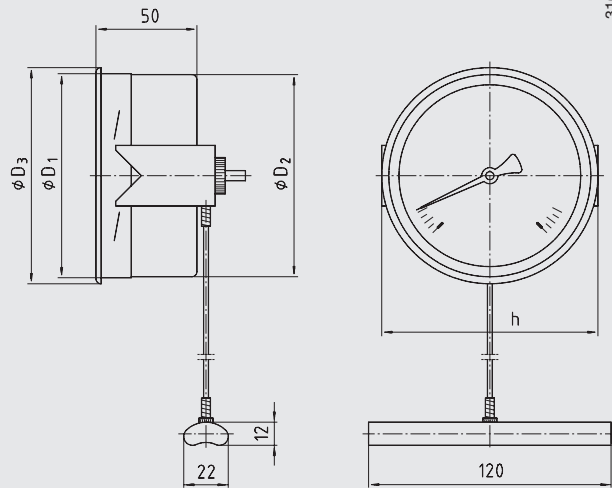
Model F73.XXX, with contact bulb capillary and panel mounting flange

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Model F73.XXX, with contact bulb capillary and triangular bezel with bracket 1)

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1) Not suitable for alarm contacts.

Table of dimensions for Model F73.XXX (with contact bulb and capillary)

Nom. size	Dimensions in mm													Weight in kg
	Alarm contacts for Model 811, 821 or 831													
	without		1- or 2-way		3-way		d ₁	d ₂	d ₃	D ₁	D ₂	D ₃	h	
b	b ₁	b	b ₁	b	b ₁									
100	50	53	88	91	-	-	116	132	4,8	101	99	107	107	1.4
160	50	53	88	91	97	100	178	196	5,8	161	159	166	172	1.8

Mounting instructions for contact bulb

General

The contact bulb has been designed for mounting on a tube or tank skin. The contact bulb is to be mounted so that it lays over the measuring point down its full length. Basic requirements to ensure perfect measurement results are good thermal contact between the skin mounted contact bulb and the outside wall of the tube or tank with minimal heat loss to the ambient from the skin mounted contact bulb and measuring point.

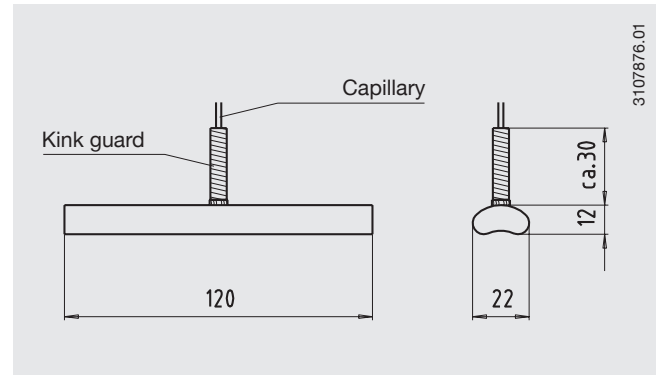
Mounting on tubes

The geometry of the contact bulb has been designed for tubes with external diameters between 20 and 160 mm. Tube clips are adequate for fastening the skin mounted contact bulb to the tube. The skin mounted contact bulb should have direct metallic contact with the measuring point and have firm contact with the surface of the tube. In so far as temperatures under 200 °C are to be expected a heat conductive paste can be used to optimise the heat transmission between skin mounted contact bulb and tube. Lagging must be applied where the skin mounted contact bulb has been mounted to avoid error due to heat loss. This lagging must have sufficient temperature resistance and is not provided with the instrument.

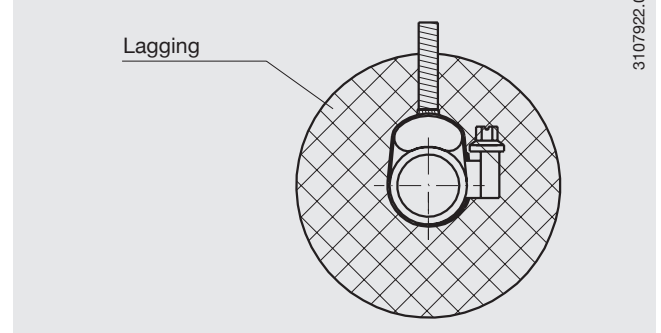
Mounting on tanks

The geometry of the contact bulb has been designed for tanks with an external radius up to 80 mm. If the mounting point of the skin mounting contact bulb on the tank has an external radius greater than 80 mm, we recommend the use of an intermediate piece designed for the respective tank diameter made of a material with good thermal conductivity. The contact bulb should be fastened to the tank by means of an angle bracket with clamping screws, or any similar method.

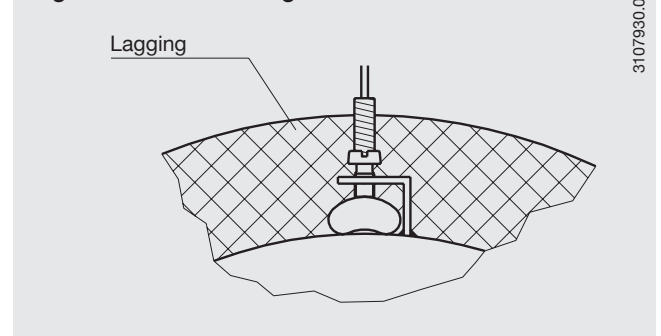
The skin mounted contact bulb should have direct metallic contact with the measuring point and have firm contact with the surface of the tank. In so far as temperatures under 200 °C are to be expected a heat conductive paste can be used to optimise the heat transmission between skin mounted contact bulb and tank. Lagging must be applied where the skin mounted contact bulb has been mounted to avoid error due to heat loss. This lagging must have sufficient temperature resistance and is not provided with the instrument.



Tube clip mounting

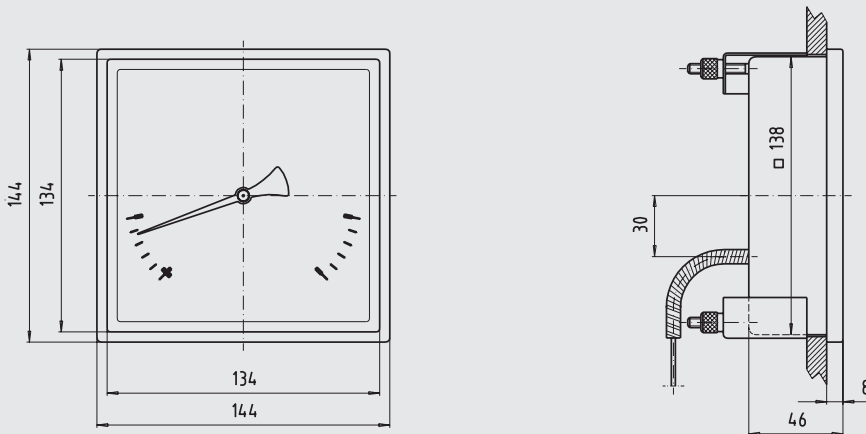


Angle bracket mounting



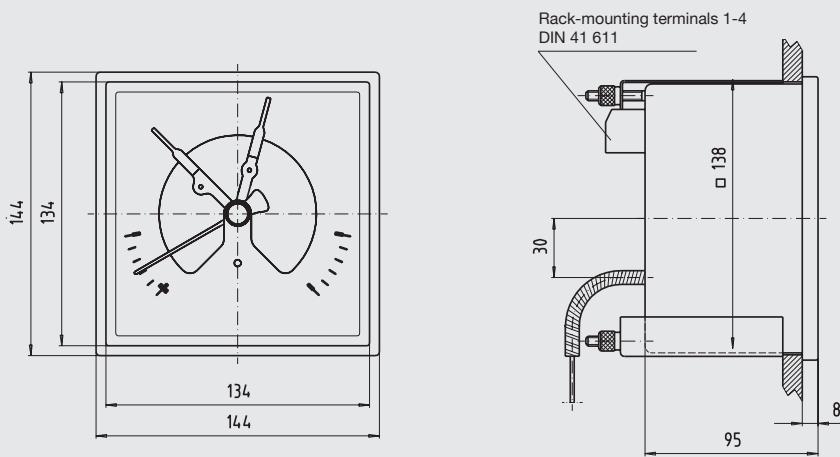
Model Q73.144, panel mounting series

Panel mounting case, 144 x 144 mm, lower back capillary entry

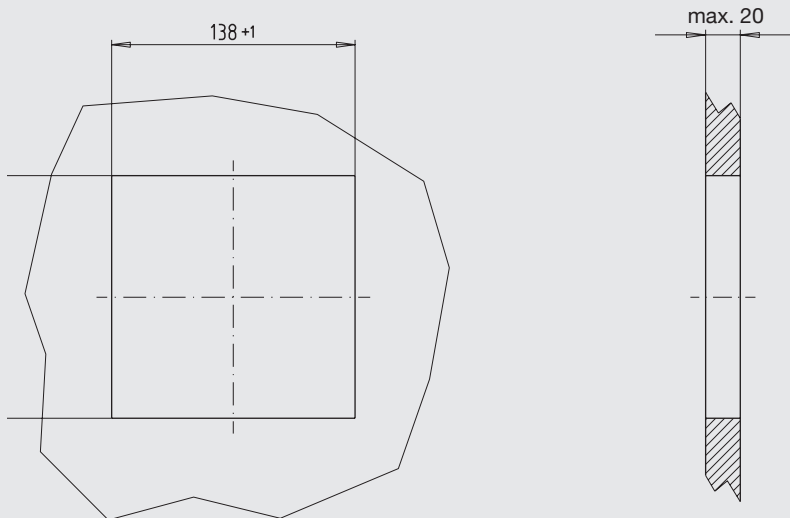


**Model Q73.144, panel mounting series
with optional alarm contacts**

Panel mounting case, 144 x 144 mm, lower back capillary entry



Panel cutout in mm



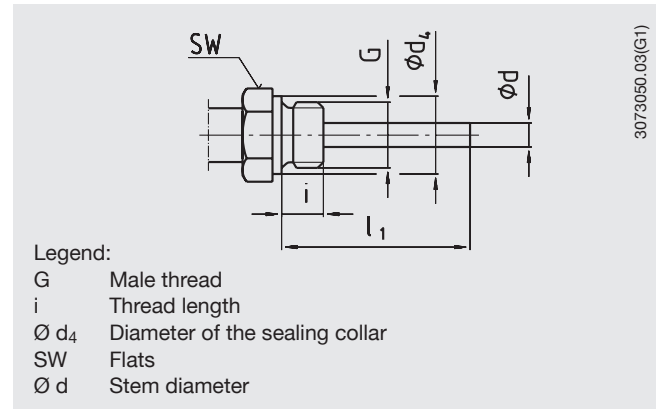
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Design of connection

Design standard (male thread connection)

Standard stem lengths: $l_1 = 63, 100, 160, 200, 250$ mm
(not with F73.XXX and Q73.144)

Nominal size NS	Process connection			Dimensions in mm	
	G	i	SW	d_4	$\varnothing d$
100, 160	G 1/2 B	14	27	26	6, 8, 10, 12
	G 3/4 B	16	32	32	6, 8, 10, 12
	1/2 NPT	19	22	-	6, 8, 10, 12
	3/4 NPT	20	30	-	6, 8, 10, 12

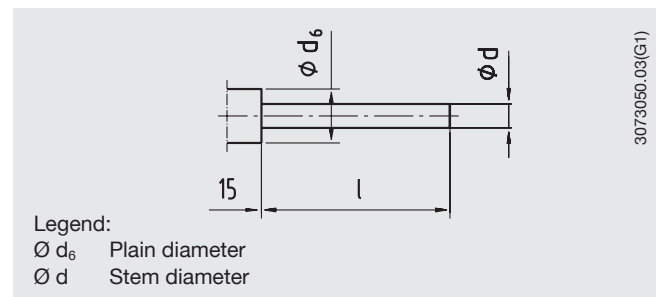


Design 1, plain stem (without thread)

Standard stem lengths: $l = 100, 140, 200, 240, 290$ mm
Basis for design 4, compression fitting

Nominal size NS	Dimensions in mm	
	$d_6^{1)}$	$\varnothing d$
100, 160, 144 x 144	18	6, 8, 10, 12

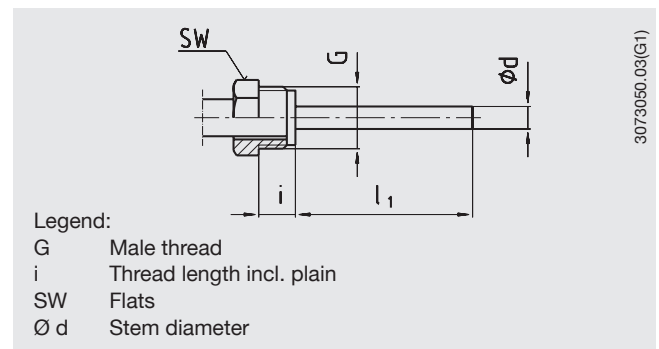
1) Not applicable to version with capillary



Design 2, male nut

Standard stem lengths: $l_1 = 80, 140, 180, 230$ mm

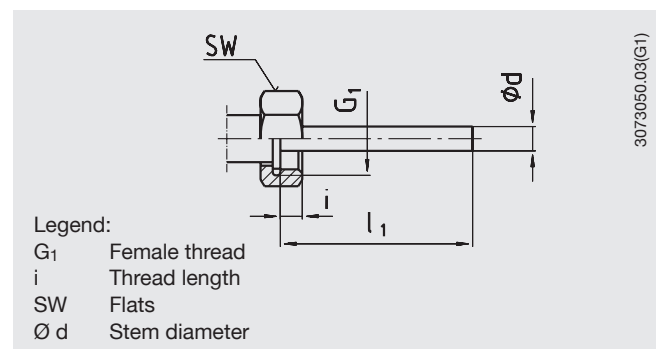
Nominal size NS	Process connection			Dimensions in mm	
	G	i	SW	$\varnothing d$	
100, 160, 144 x 144	G 1/2 B	20	27	6, 8, 10, 12	
	M20 x 1.5	15	22	6, 8, 10, 12	



Design 3, union nut

Standard stem lengths: $l_1 = 89, 126, 186, 226, 276$ mm

Nominal size NS	Process connection			Dimensions in mm	
	G1	i	SW	$\varnothing d$	
100, 160, 144 x 144	G 1/2	8.5	27	6, 8, 10, 12	
	G 3/4	10.5	32	6, 8, 10, 12	
	M24 x 1.5	13.5	32	6, 8, 10, 12	

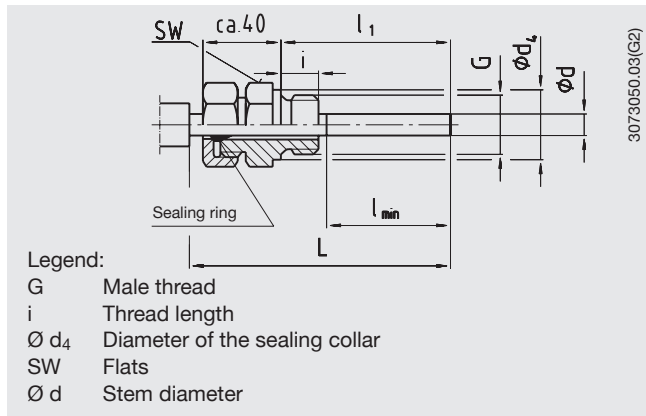


Design 4, compression fitting (sliding on stem)

Stem length: $l_1 = \text{variable}$

Length $L = l_1 + 40 \text{ mm}$

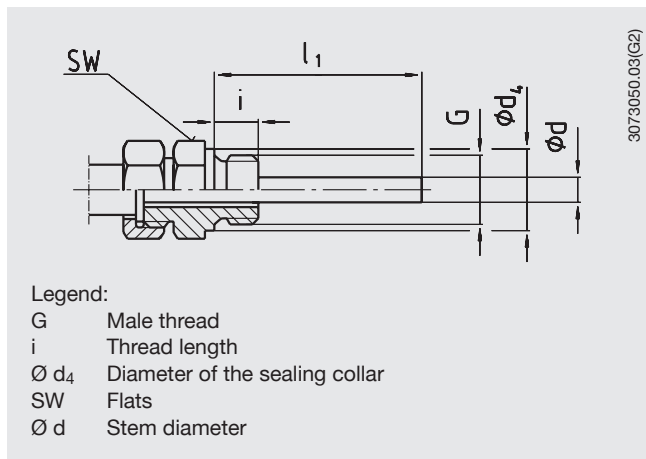
Nominal size NS	Process connection			Dimensions in mm		
	G	i	SW	d_4	$\varnothing d$	
100, 160, 144 x 144	G 1/2 B	14	27	26	6, 8, 10, 12	
	G 3/4 B	16	32	32	6, 8, 10, 12	
	M18 x 1.5	12	24	23	6, 8, 10, 12	
	1/2 NPT	19	22	-	6, 8, 10, 12	
	3/4 NPT	20	30	-	6, 8, 10, 12	



Design 5, union nut with fitting

Standard stem lengths: $l_1 = 63, 100, 160, 200, 250 \text{ mm}$

Nominal size NS	Process connection			Dimensions in mm		
	G	i	SW	d_4	$\varnothing d$	
100, 160, 144 x 144	G 1/2 B	14	27	26	6, 8, 10, 12	
	G 3/4 B	16	32	32	6, 8, 10, 12	
	M18 x 1.5	12	24	23	6, 8, 10, 12	
	1/2 NPT	19	22	-	6, 8, 10, 12	
	3/4 NPT	20	30	-	6, 8, 10, 12	



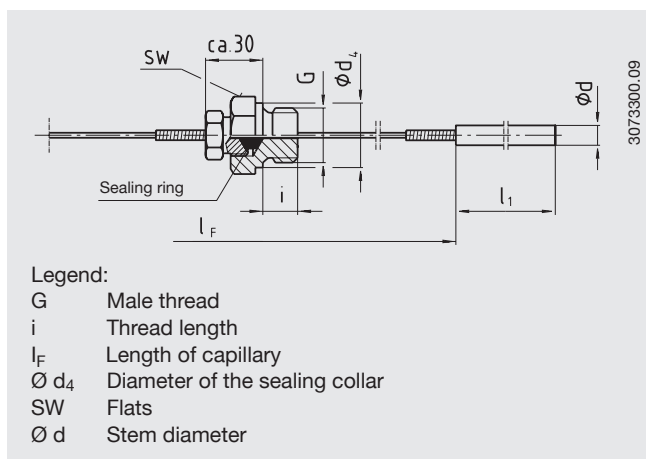
Option: Union nut M24 x 1.5 with fitting M18 x 1.5

Nominal size NS	Process connection			Dimensions in mm		
	G	i	SW	d_4	$\varnothing d$	
100, 160	M18 x 1.5	12	32	23	6, 8, 10	

Design 6.1, compression fitting sliding on capillary (compression fitting is leak-proof)

Standard stem lengths: $l_1 = 100 \text{ mm}$ (others on request)

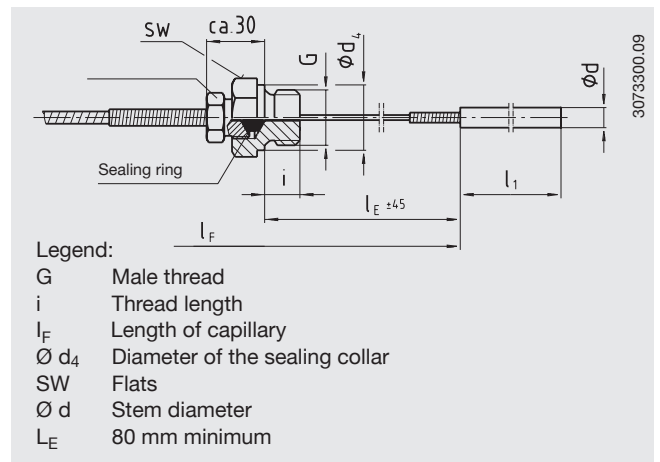
Nominal size NS	Process connection			Dimensions in mm		
	G	i	SW	d_4	$\varnothing d$	
100, 160, 144 x 144	G 1/2 B	14	27	26	6, 8, 10, 12	
	G 3/4 B	16	32	32	6, 8, 10, 12	
	1/2 NPT	19	22	-	6, 8, 10, 12	
	3/4 NPT	20	30	-	6, 8, 10, 12	



Design 6.2, compression fitting sliding on capillary with spiral protecting hose (compression fitting is leak-proof)

Standard stem lengths: $l_1 = 100$ mm (others on request)

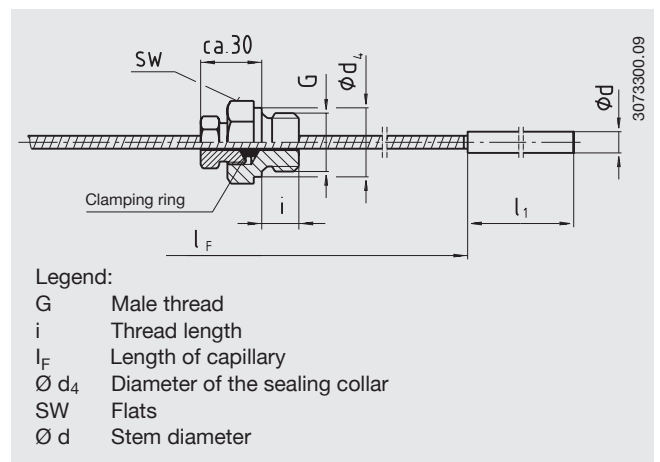
Nominal size NS	Process connection			Dimensions in mm	
	G	i	SW	d_4	$\varnothing d$
100, 160, 144 x 144	G 1/2 B	14	27	26	6, 8, 10, 12
	G 3/4 B	16	32	32	6, 8, 10, 12
	1/2 NPT	19	22	-	6, 8, 10, 12
	3/4 NPT	20	30	-	6, 8, 10, 12



Design 6.3, compression fitting sliding on spiral protecting hose (compression fitting is not leak-proof)

Standard stem lengths: $l_1 = 100$ mm (others on request)

Nominal size NS	Process connection			Dimensions in mm	
	G	i	SW	d_4	$\varnothing d$
100, 160, 144 x 144	G 1/2 B	14	27	26	6, 8, 10, 12
	G 3/4 B	16	32	32	6, 8, 10, 12
	1/2 NPT	19	22	-	6, 8, 10, 12
	3/4 NPT	20	30	-	6, 8, 10, 12



Ordering information

Model / Nominal size / Scale range / Design of connection / Process connection / Length l , l_1 / Length of capillary l_F / Options

Modifications may take place and materials specified may be replaced by others without prior notice.
Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing.



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